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more and more come to be regarded as a branch of physiology proper. The theory of representative particles must be relegated to the class of formal hypotheses whose usefulness is largely outlived; and while it may still play a part in speculations on heredity, the author believes that it will come to be generally recognized by those who use it as a mere matter of convenience of terminology, and not as an explanation of the phenomena described in its terms.—J. M. C.

The rôle of glucosides.—WEEVERS continues his researches on the glucosides of plants, with investigations of arbutin and salicin, and their allies.[11] He reports that both are to be considered as reserve foods, the combination of benzol derivatives with glucose serving to form compounds of low diffusibility, and therefore suitable for the accumulation of sugar in the cells. Arbutin in *Vaccinium Vitis-idaea* is localized in the leaves, and is used in the spring when the shoots develop, being split by an enzyme into glucose and hydrochinon. The latter remains in the leaves and is used again to combine with the glucose formed by photosynthesis, none being free in autumn. *Pirus communis* contains a glucoside which is probably identical with arbutin, and behaves in the same way. In *Salix purpurea* and *Populus monilifera* there appears to be a complex of enzymes, of which one, salicase, splits salicin into saligenol and glucose; another, saligenase, destroys saligenol and produces catechol; and a third breaks up catechol, forming a black amorphous insoluble pigment. This catecholase, however, gets at catechol only on decay of the tissues. All summer, salicin is formed daily in the leaves; nightly it is hydrolyzed and the glucose is carried away to the cortex. When in autumn the salicin content of the cortex approaches that of the leaves, this process stops. Populin is another product common to the two genera, but more variable in behavior. Populase forms catechol from it also.—C. R. B.

Hindi cotton.—COOK[12] has published a statement in reference to Hindi cotton, the interest of which extends beyond the immediate cultural problem. The name is applied in Egypt to an undesirable type of cotton that injures the high-grade varieties by infesting them with hybrids. The introduction of Egyptian cotton into the United States has introduced also the problem of Hindi cotton. There has been much speculation as to the nature and origin of this pernicious type, the name having suggested an origin from India. Experiments with Egyptian cotton in Arizona resulted in the appearance of the so-called "Hindi" variations, and comparison with other types show that Hindi cotton is of American origin. It is not identical with any of the upland varieties of the United States, but is to be associated with upland types indigenous in Mexico and Central America. Egyptian and other Sea Island types also have originated in tropical America, and the author concludes that "it becomes possible to view the Hindi variants as ex-

[11] WEEVERS, TH., Die physiologische Bedeutung einiger Glycoside. (Fortsetzung.) Recueil Trav. Bot. Néerl. **7**:1–62. 1910.

[12] COOK, O. F., Origin of the Hindi cotton. Circ. 42, Bur. Pl. Ind., U. S. Depart. Agric. pp. 12. *figs.* 2. 1909.

amples of reversion to remote ancestral characters rather than as results of recent hybridization."—J. M. C.

Comparative leaf anatomy of Agave.—In a genus consisting of species so incompletely characterized and so hard to differentiate as those of the succulents usually are, every applicable character is valuable and its application is a real service to science. Little beyond the most general and scattered facts have heretofore been recorded for the histology of Agave, and a recently published study of its leaf anatomy, by MÜLLER,[13] therefore, stands alone on the shelves. The difficulty of such a study and the value of its outcome are as largely influenced by the accuracy of naming and the representative character of the material on which it is based as on fulness of representation. In the present case the large collections of Palermo and La Mortola, where many of the species are planted out in the open, furnished material which is as likely to have been normal and accurately named as could be hoped for in the genus Agave, and its examination seems to have been carefully and systematically made. The details of structure, which are rather fully illustrated by means of drawings and low-power photographs, are followed by an analytical key occupying five quarto pages, and yet it is doubtful whether tenable names are likely to be found for many plants by its aid.—W. TRELEASE.

Death by low temperature.—Using the molds, Aspergillus, Penicillium, and Botrytis, BARTETZKO has made a new investigation under the guidance of PFEFFER, on death by cold.[14] He finds these fungi able to bear temperatures in a sub-cooled solution (without actual freezing) which would be fatal in the same time were the solution allowed to freeze. But even in the sub-cooled solution death ensues on longer exposure. With increase in the osmotic pressure of the plant sap there is a lowering of the death point, but there is no simple relation between the two. Isotonic solutions of different sorts have nearly the same effect on the resistance of the plant to cold. Only with *Aspergillus niger* did the use of a potassium nitrate solution reduce the resistance notably. In contrast to the conclusion of MOLISCH, BARTETZKO thinks death by cold cannot be due merely to withdrawal of water, because in certain cases this will be borne, while in others death takes place above the temperature at which any considerable loss of water occurs.—C. R. B.

Root excretions.—Inasmuch as the minuteness of the quantity of root excretions has again and again prevented the determination of the kind of acid, other than H_2CO_3, whose presence the corrosion experiments have led observers to

[13] MÜLLER, CARL, Beiträge zur vergleichenden Anatomie der Blätter der Gattung Agave und ihrer Verwertung für die Untersoheidung der Arten. Bot. Zeit. **67**[1]:93–139. *pls. 4, 5. figs. 22.* 1909.

[14] BARTETZKO, HUGO, Untersuchungen über das Erfrieren von Schimmelpilzen. Jahrb. Wiss. Bot. **47**:57–98. 1909.